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(54) Abstract Title

Programmed media reproduction using communication network

(57) Client is connected to a selected program serving site via a communication network. The program serving site includes a database storing plural types of contents having various different characters and can supply a program file defining a reproducing sequence of a plurality of contents including those of different characters. The client includes a plurality of types of reproduction engines which are capable of reproducing the contents of the respective characters. The client receives a program file from the program serving site and also receives, from the database of the site, contents specified by the received program file. The individual contents in a reproducing sequence defined by the program file are reproduced by use of any one of the reproduction engines corresponding to the type of each content to be reproduced. The program progression can be fast-forwarded or fast-reversed by fast-forwarding or fast-rewinding a currently-reproduced content. Contents meeting a search condition specified by the client are searched for and retrieved from the program serving site, and a new program file including the retrieved contents is created. The client can edit the program file, display information pertaining to the currently-reproduced content and select and purchase any desired content.

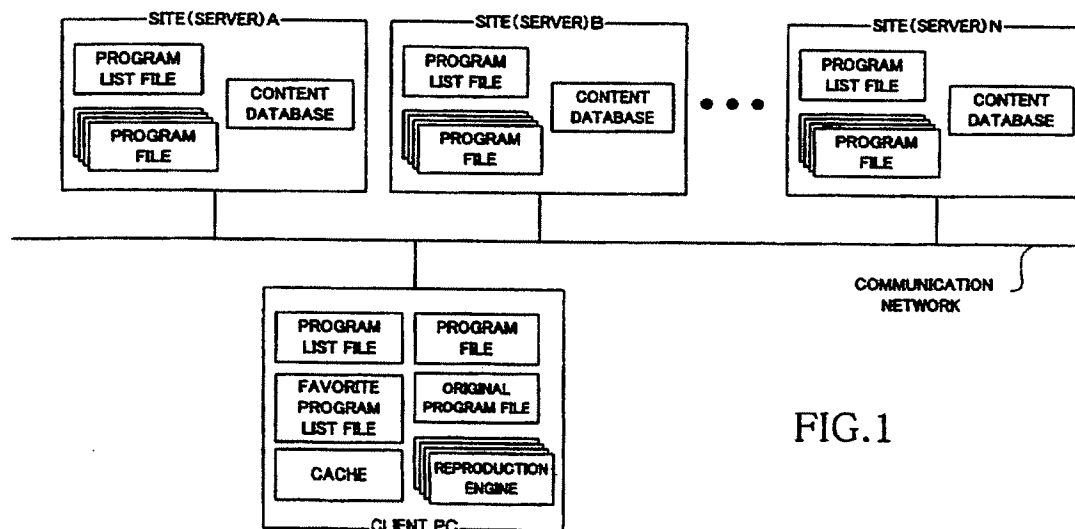


FIG.1

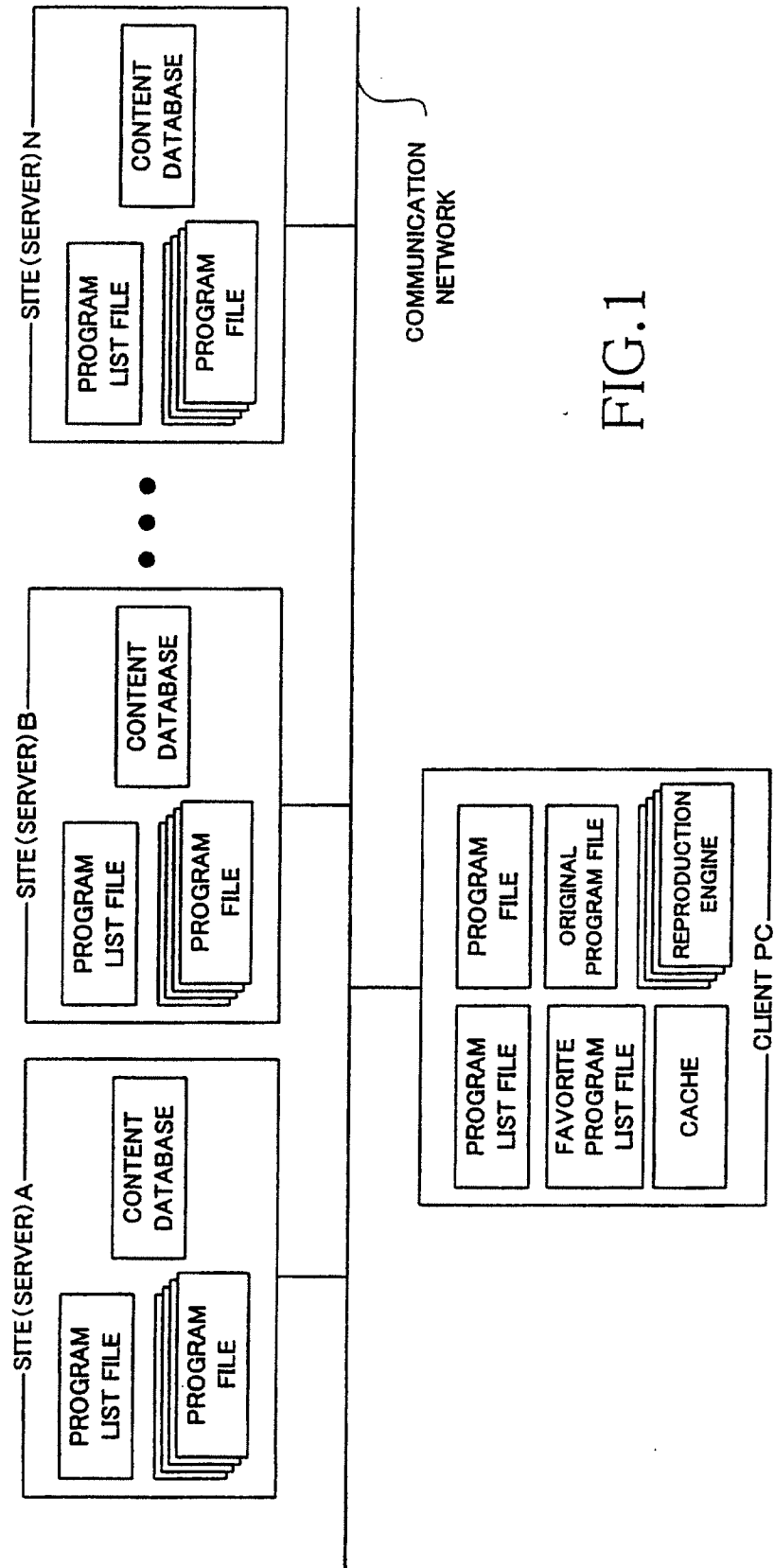


FIG.1

<PROGRAM LIST FILE>

PROGRAM NAME	URL OF PROGRAM FILE
PROGRAM NAME	URL OF PROGRAM FILE
:	:

FIG. 2

<PROGRAM FILE>

PROGRAM NAME			REPRO. SEQUENCE
CONTENT URL	CONTENT ID	BASIC CONTENT INFO.	OPENING MC(AUDIO)
CONTENT URL	CONTENT ID	BASIC CONTENT INFO.	MUSIC PIECE (MIDI)
CONTENT URL	CONTENT ID	BASIC CONTENT INFO.	MC(AUDIO)
CONTENT URL	CONTENT ID	BASIC CONTENT INFO.	MUSIC PIECE(AUDIO)
CONTENT URL	CONTENT ID	BASIC CONTENT INFO.	MUSIC PIECE (MOVING PICTURE)
CONTENT URL	CONTENT ID	BASIC CONTENT INFO.	ENDING MC(AUDIO)

FIG. 3

<OPERATION PANEL>

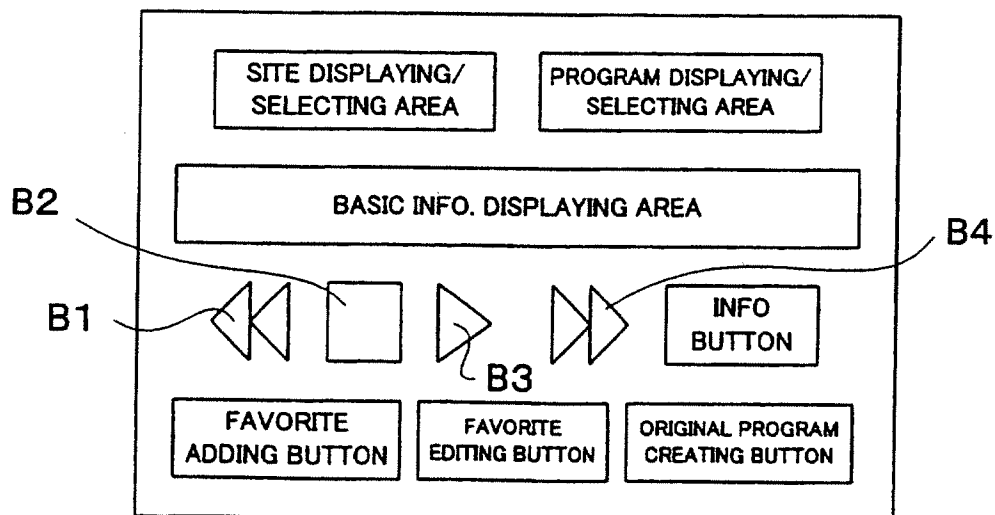


FIG. 4

<EXAMPLE OF INFORMATION DISPLAY>

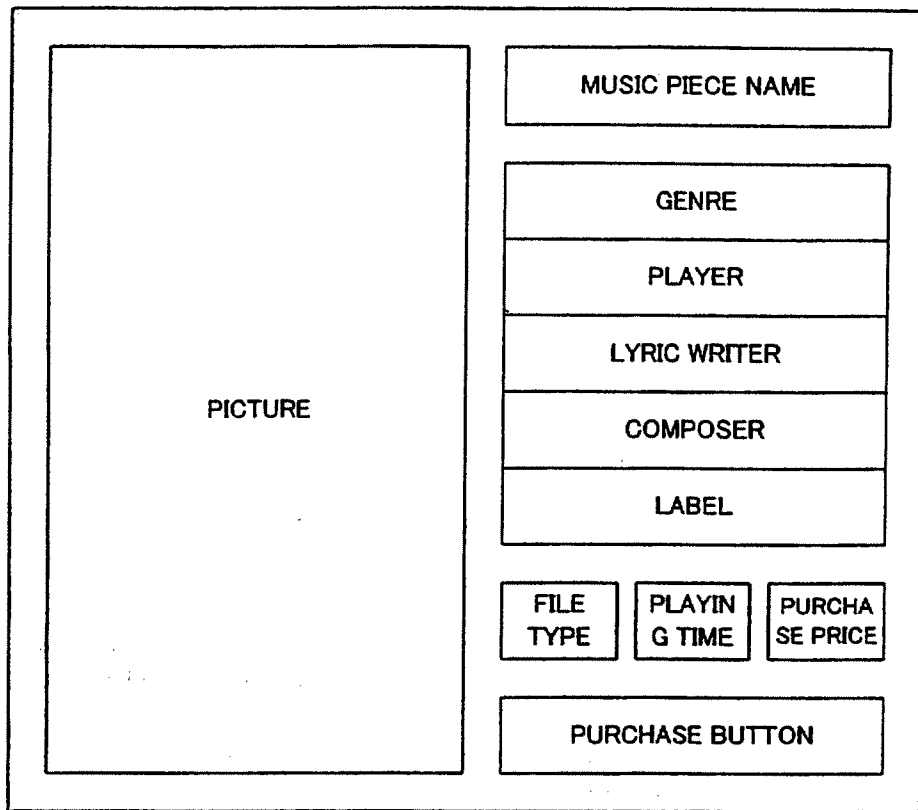


FIG. 5

<PROGRAM FILE>

PROGRAM NAME				
TR1	REPRO.TIMIG	CONTENT URL	CONTENT ID	BASIC CONTENT INFO.
	REPRO.TIMIG	CONTENT URL	CONTENT ID	BASIC CONTENT INFO.
	:	:	:	:
TR2	REPRO.TIMIG	CONTENT URL	CONTENT ID	BASIC CONTENT INFO.
	REPRO.TIMIG	CONTENT URL	CONTENT ID	BASIC CONTENT INFO.
	:	:	:	:
:	:			

REPRODUCING SEQUENCE OF TRACKS

↓

FIG. 8

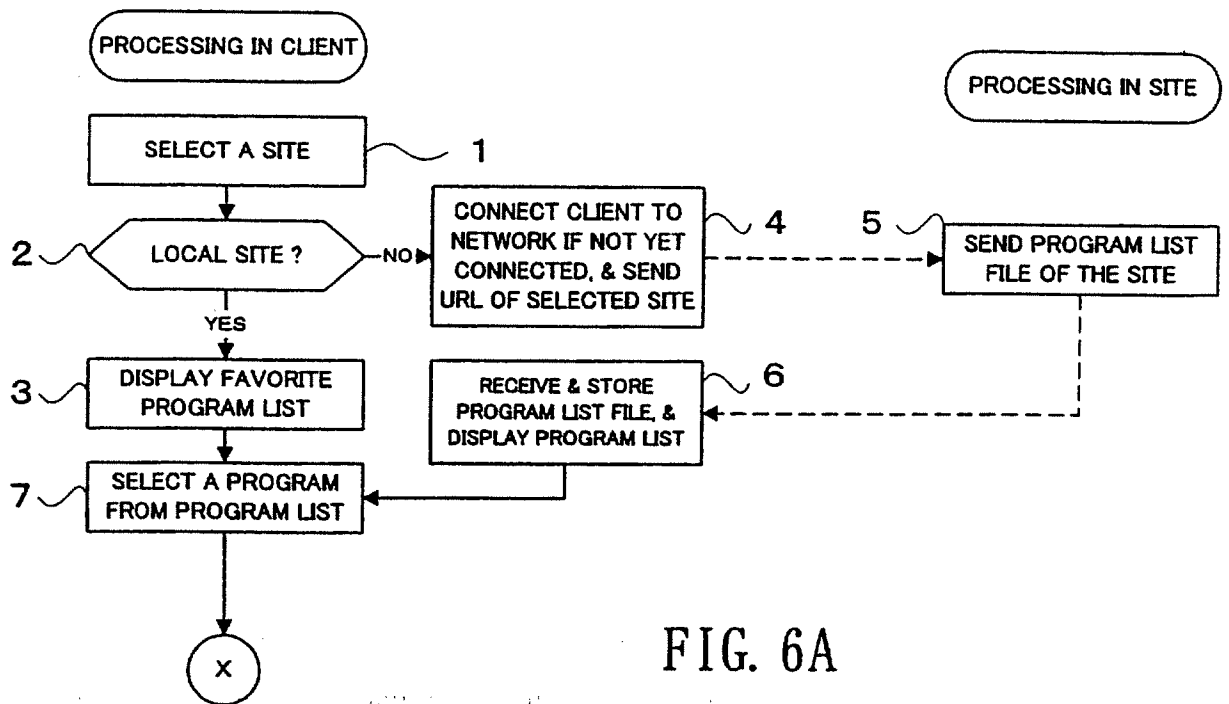


FIG. 6A

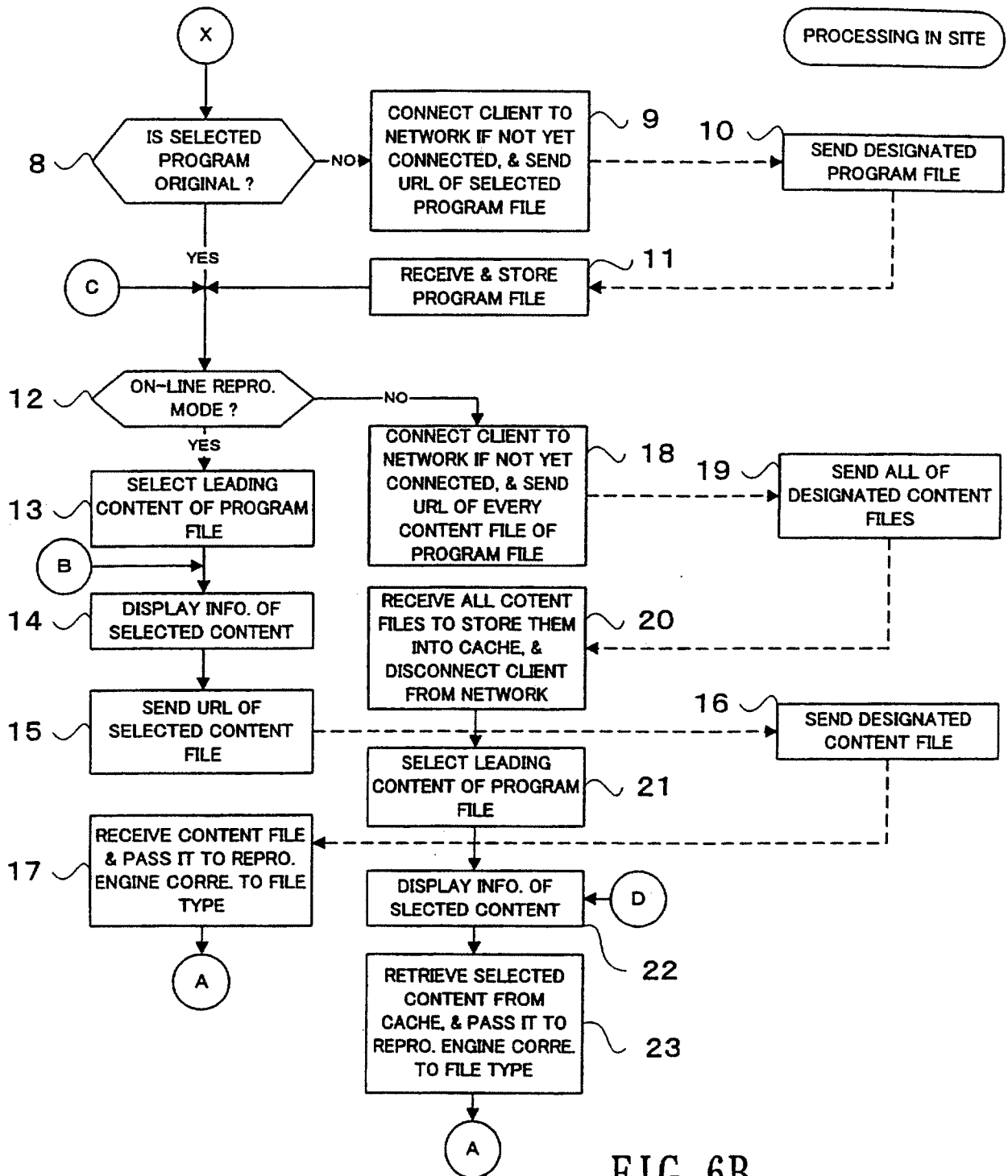


FIG. 6B

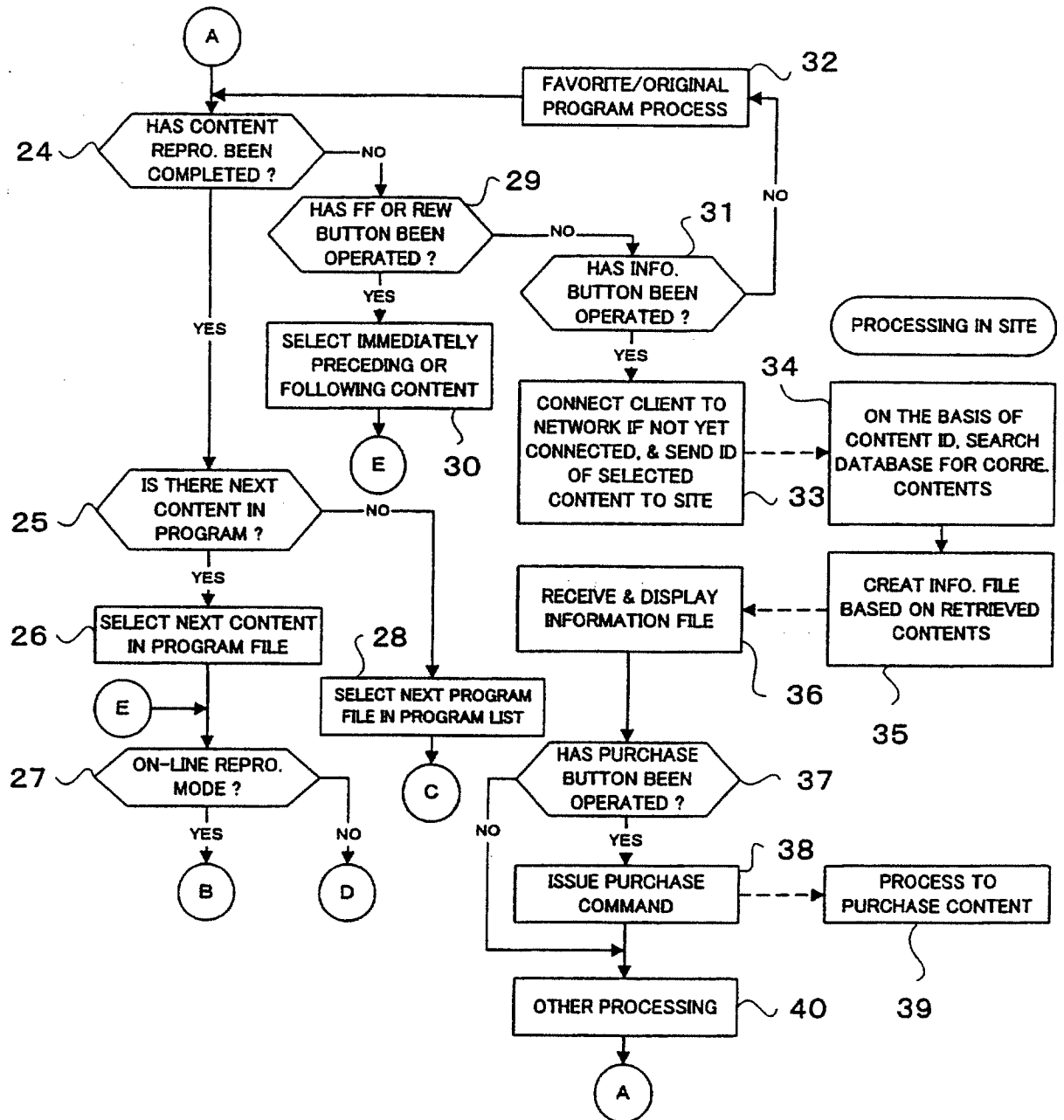


FIG. 6C

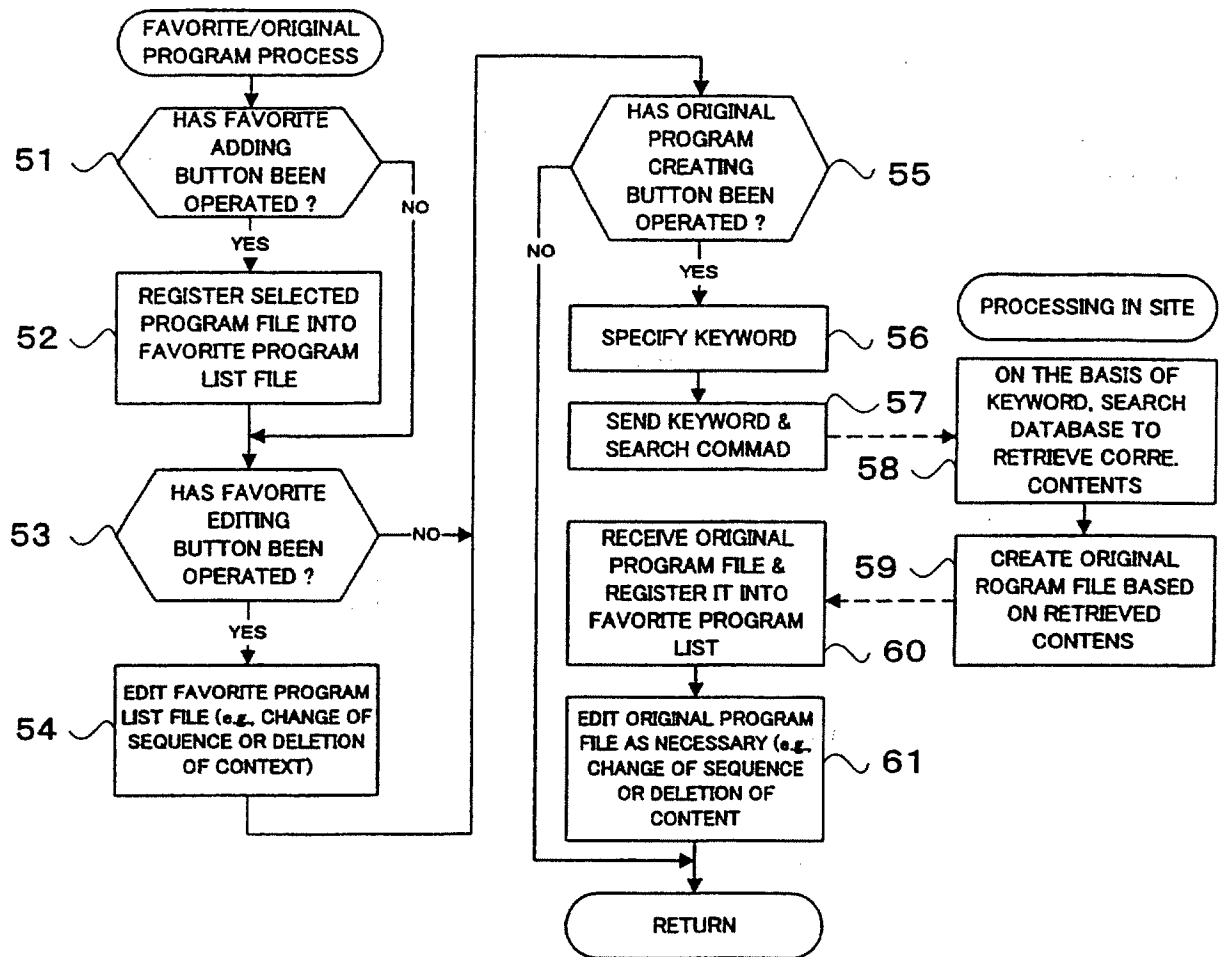


FIG. 7

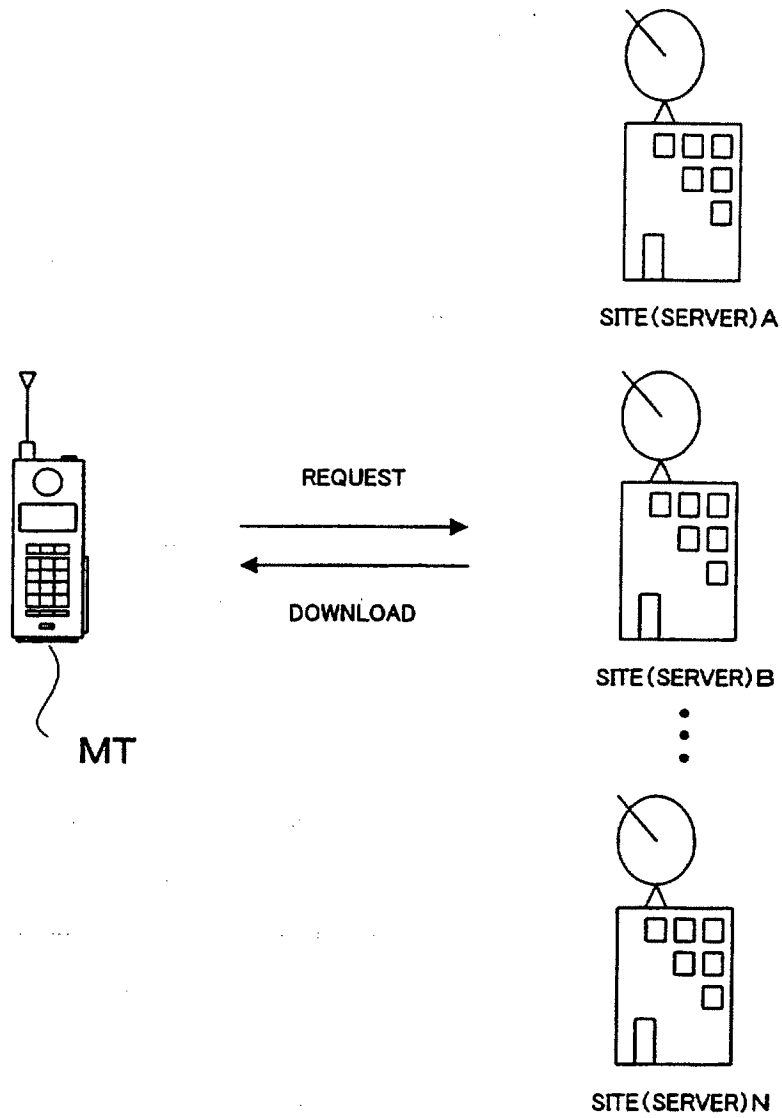


FIG. 9A

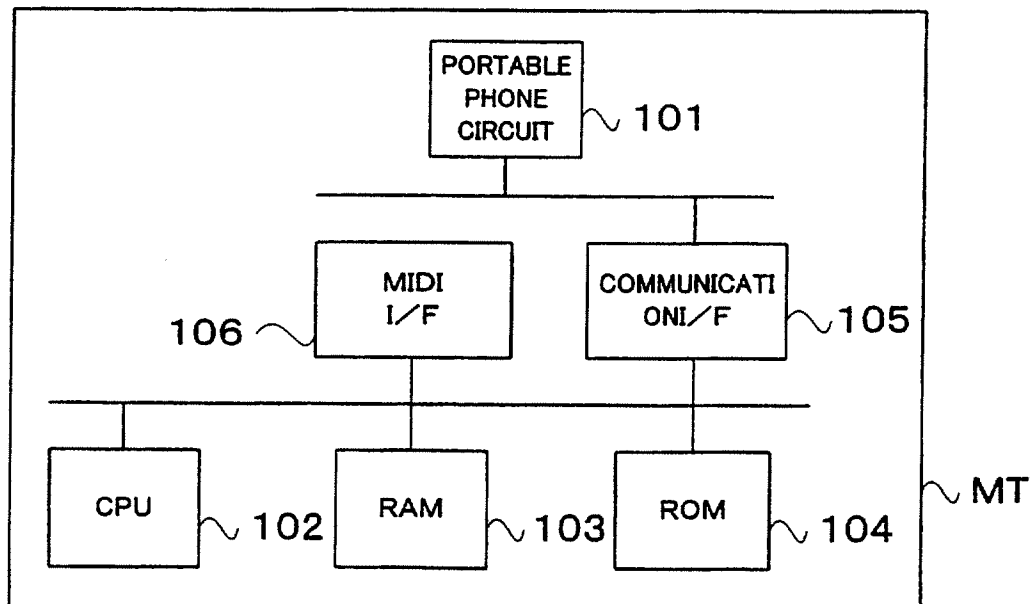


FIG. 9B

Program Reproduction System and Method Using Communication Network

The present invention relates generally to program reproduction systems and methods for reproducing broadcast programs or other types of programs, each comprised
5 of a set of music and/or picture information, downloaded or distributed via a communication network, and more particularly to an improved program reproduction system and method that are for example capable of reproducing programs comprising a mixture of various contents of different characters.

Typical examples of the conventionally-known systems for distributing broadcast
10 or other types of programs, comprised of music or video data, include radio and television broadcasting systems. However, because radio and television programs are sent unidirectionally from broadcasting stations, interested users or audiences (listeners or viewers) are unable to listen to or view their desired programs at their desired time. Thus, "Internet" broadcasting stations have recently come on the scene as a new form of
15 program distributing facility that is different from the existing radio and television broadcasting stations. The Internet broadcasting stations each distribute any of programs stored somewhere on a communication network, at an interested user's request; that is, on the basis of an interested user's request entered via a terminal (client) such as a personal computer (PC), the client station is connected to a World Wide Web (WWW)
20 server by way of a communication network, such as the Internet, so that the client station is supplied with a program of music piece or video (picture) data stored previously in the WWW server and then reproduces the program on the basis of the received data. Normally, for data distribution using a communication network, each WWW server distributes the data in streams to a client station in such a manner that reproduction of a
25 requested music piece, picture or the like can be initiated before reception of all the necessary data has been completed by the client station. With such an Internet broadcasting station, audiences are allowed to listen to or view any desired programs at any desired convenient time.

Program contents to be distributed via a communication network can be diversified
30 by making programs of a wide variety of contents. For that purpose, the programs have to be made to contain a plurality of contents having different characters (e.g., different data formats) in a mixed fashion. However, with the above-mentioned Internet

broadcasting stations, all the contents in each one of the programs are arranged to have a same character (same data format). Namely, the Internet broadcasting stations today can not provide programs of diversified contents due to the fact that the conventionally-known program reproduction systems used in connection with the Internet
5 broadcasting stations and the like are unable to reproduce programs containing a plurality of types of contents having different characters in a mixed fashion (e.g., programs which comprise a mixture of plural types of contents prepared in different data formats, such as contents of MIDI music performance information, audio sounds and pictures).

Further, with the conventionally-known program reproduction systems, interested
10 users can not freely enjoy a distributed program by fast-forwarding/fast-rewinding a desired content within the program. Further, interested users can not purchase a desired content of the distributed program. In addition, interested users can not create their own original program by optionally combining a plurality of contents of the distributed program. Besides, interested users are unable to view information pertaining to and
15 descriptive of sequentially reproduced contents (i.e., content-related information) separately on a content-by-content basis.

The present invention seeks to provide a program reproduction system and method which are capable of appropriately reproducing a program that comprises various types of contents of different characters in a mixed fashion.

20 The present invention also seeks to provide a program reproduction system and method which allow a user to fast-forward or fast-rewind a desired content within a program even during reproduction of the program.

Furthermore, the present invention seeks to provide a program reproduction system and method which allow an interested user to purchase any desired content
25 reproduced thereby.

The present invention also seeks to provide a program reproduction system and method which allow a user to create an original program.

Furthermore, the present invention seeks to provide a program reproduction system and method which allow a user to view various information pertaining to and
30 descriptive of contents sequentially reproduced within a program.

To accomplish the above-mentioned objects, there is provided, according a first aspect of the present invention, a program reproduction system for transmitting and

reproducing contents via a communication network, which comprises: a program serving site having a memory storing a plurality of types of contents having different characters and adapted to supply a program file defining a reproducing sequence of a plurality of contents including contents of different characters; and a client connectable to the program serving site via the communication network and having a plurality of types of reproduction engines capable of reproducing the plurality of types of contents having different characters. The client in the inventive system is adapted to: receive a program file from the program serving site; receive, from the program serving site, contents specified by the received program file; and reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced, using any one of the reproduction engines which corresponds to the type of the content to be reproduced.

According to the primary aspect of the present invention, the program file only includes information that defines a reproducing sequence of a plurality of contents constituting a program such as an Internet-broadcast program or other type of network-distributed program; that is, the program file itself does not include such contents. The individual contents specified by this program file are retrieved one by one from the memory (i.e., content database) of the program serving site, in response to a request given from the client. Thus, even for a given program comprising a plurality of contents that differ in their type, i.e., data format, a program file corresponding to the given program can be readily made by merely combining these contexts. The client or client station, on the other hand, includes a plurality of types of reproduction engines provided in corresponding relation to and capable of reproducing the plurality of types of contents having different characters. Thus, the client station can reproduce each of the contents, selectably using any one of the reproduction engines which corresponds to the type of the content to be reproduced. Consequently, even where various types of contents having different characters are mixedly included in a program file, these contents in the program file can be reproduced appropriately by the client using the different reproduction engines as appropriate. Therefore, according to the first aspect of the present invention, it is possible to readily create and then appropriately reproduce a program comprising a mixture of various types of contents having different characters, such as contents of music performance information in the form of MIDI data, contents of talk or other sound information in the form of audio data, and contents of picture

information in the form of video data. As a result, the present invention provides for creation and reproduction of programs having greatly diversified contents.

In one preferred implementation of the present invention, the program serving site is capable of supplying a plurality of program files, and the client is adapted to selectively
5 designate a desired one of the plurality of program files and receive the designated desired program file from the program serving site. Further, the client may be adapted to selectively designate a desired one of the plurality of program files and make a program list containing the designated desired program file. Thus, an interested user is allowed to readily select any desired program.

10 According to a second aspect of the present invention, there is provided a program reproduction system for transmitting and reproducing contents via a communication network, which comprises: a program serving site including a memory storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents; and a client connectable to the program serving site via the
15 communication network and including a reproduction engine for reproducing contents and an operator adapted to give at least one of fast-forwarding and fast-rewinding instructions. The client is adapted to: receive a program file from the program serving site; receive, from the program serving site, contents specified by the received program file; reproduce each of the received contents in a reproducing sequence defined by a program file to be
20 reproduced, using the reproduction engine; and fast-forward or fast-rewind a currently-reproduced content in the program file to be reproduced, in accordance with the fast-forwarding or fast-rewinding instruction given via the operator.

According to the second aspect of the present invention, the client or client station is allowed to not only reproduce a program made up of a plurality of contents but also
25 fast-forward or fast-rewind (fast-reverse) the progression of the program by fast-forwarding or fast-rewinding a content being currently reproduced. As noted earlier, the program serving site stores therein a program file corresponding to a program to be distributed, as well as contents constituting the program with each content as a separate data group. In the reproducing sequence or order defined by the program file, the client
30 receives or acquires the contents from the program serving site and reproduces the received contents. For example, when an instruction to fast-forward or fast-rewind a specific content of a currently-reproduced program is given, the client acquires another

content that precedes or follows the specific content in the reproducing sequence defined by the program file, in response to the instruction. This way, the client can reproduce the program while fast-forwarding or fast-rewinding a selected content or contents.

According to a third aspect of the present invention, there is provided a program reproduction system for transmitting and reproducing contents via a communication network, which comprises: a program serving site including a memory storing a plurality of contents, and adapted to make a search through the memory to retrieve therefrom one or more contents satisfying a given search condition and make a program file defining a reproducing sequence of a plurality of contents containing the retrieved contents; and a client connectable to the program serving site via the communication network and including a reproduction engine for reproducing contents. The client is adapted to: specify a desired search condition to the program serving site; receive a program file from the program serving site; receive, from the program serving site, contents specified by the received program file; and reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced, using the reproduction engine.

According to the third aspect of the present invention, the client is allowed to independently and readily create an original program of contents matching a predetermined condition and appropriately reproduce the thus-created program. For that purpose, the program serving site searches the memory (content database) for one or more contents matching the search condition specified by the client. Once such contents matching the specified search condition have been retrieved from the memory of the program serving site, a new program file is created such as by sequentially registering the contents into the program file. The new program file may be made up solely of the retrieved contents or be made by replacing part of the existing contents with the retrieved contents. In this way, the client is allowed to freely create a program in an independent fashion that has not been provided previously in the program serving site and also appropriately reproduce the thus-created original program.

In one preferred implementation, the client includes an operator and a processor coupled with the operator, and the processor is adapted to, in response to an operation of the operator, edit the reproducing sequence of the contents in the program file received from the program serving site. The editing may be made such as by changing the

reproducing sequence of the contents in the received program file or deleting any of the contents. With this arrangement, the user, i.e., listener or viewer, is allowed to readily change the reproducing sequence of the contents in the received program file or delete any of the contents as desired.

5 According to a fourth aspect of the present invention, there is provided a program reproduction system for transmitting and reproducing contents via a communication network, which comprises: a program serving site including a memory storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents and content-related information for individual ones of the contents;
 10 and a client connectable to the program serving site via the communication network and including a reproduction engine for reproducing contents and a display section. The client is adapted to: receive a program file from the program serving site; receive, from the program serving site, contents specified by the received program file; reproduce each of the received contents in a reproducing sequence defined by a program file to be
 15 reproduced, using the reproduction engine; and receive, from the program serving site, the content-related information for each received content or each content which is being currently reproduced and display the received content-related information on the display section.

 In one preferred implementation of the present invention, the program file contains
 20 identification information identifying the individual contents, and the client receives the content-related information from the program serving site on the basis of the identification information of the currently reproduced content.

 According to a fifth aspect of the present invention, there is provided a program reproduction system for transmitting and reproducing contents via a communication
 25 network, which comprises: a program serving site including a memory storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, the program file containing content-related information for individual ones of the contents; and a client connectable to the program serving site via the communication network and including a reproduction engine for reproducing contents and
 30 a display section. The client is adapted to: receive a program file from the program serving site; receive, from the program serving site, contents specified by the received program file; reproduce each of the received contents in a reproducing sequence defined

by a program file to be reproduced, using the reproduction engine; and retrieve, from the program serving site, the content-related information for each received content or each content which is being currently reproduced and visually display the retrieved content-related information on the display section.

5 According to the fourth and fifth aspects of the present invention, various information pertaining to contents to be sequentially reproduced (content-related information) can be visually presented on the display section. The content-related information for the individual contents prestored in the memory (content database) may be stored in a suitable memory or incorporated in a program file on the side of the
10 program serving site. When the client receives given contents from the program serving site or is in the process of reproducing a specific content, the content-related information for each received content or each currently reproduced content is visually displayed on the display section. In the case where such content-related information is stored in the memory of the program serving site, the client acquires the content-related information
15 from the memory of the program serving site. In the case where such content-related information is incorporated in the program file received by the client, on the other hand, the content-related information is read out from the received program file and displayed on the display section. In this way, the client can reproduce the program while displaying the content-related information descriptive of the program.

20 According to a sixth aspect of the present invention, there is provided a program reproduction system for transmitting and reproducing contents via a communication network, which comprises: a program serving site including a memory storing a plurality of contents, and adapted to supply a program file defining a reproducing sequence of a plurality of contents and perform a content selling process upon receipt of a content
25 purchase request; and a client connectable to the program serving site via the communication network and including a reproduction engine for reproducing contents and an operator. The client being adapted to: receive a program file from the program serving site; receive, from the program serving site, contents specified by the received program file; reproduce each of the received contents in a reproducing sequence defined
30 by a program file to be reproduced, using the reproduction engine; and generate a content purchase request in response to an operation of the operator and transmit the content purchase request to the program serving site.

According to the sixth aspect of the invention, any interested user of the client station is allowed to purchase any desired content of a program which he or she is listening to or viewing. For this purpose, the user manipulates the operator to issue, to the program serving site, a content purchase request asking for the desired content. Upon receipt of such a content purchase request from the client, the program serving site carries out a predetermined process to sell the requested content to the client. Because, in the present invention, the individual contents are prestored in the memory (content database) of the program serving site separately from the program file and separately from each other --instead of each program made up of a plurality of contents being prestored in its entirety as a single set of data--, the client can acquire each individual content separately from the program serving site. As a result, the client allows the user to selectively purchase only a desired one of the contents of the program.

In one preferred implementation of the present invention, the client generates a content purchase request asking for one of the contents which is being currently reproduced and transmits the content purchase request to the program serving site. In response to the content purchase request from the client, the program serving site performs the selling process to sell the client a regular (i.e., non-sample) content corresponding to the content being currently reproduced by the client.

In one preferred embodiment of the present invention, the program serving site supplies the client with a predetermined sample content in response to a content purchase request from the client asking for any one of the contents specified by the program file. Then, for each of the contents having been finally determined to be sold via the selling process, the program serving site supplies the client with a non-sample regular content.

In one preferred implementation of the present invention, the program file contains storage location information that is indicative of a storage location of each of the contents in the program serving site, and the client receives a desired one of the contents from the program serving site on the basis of such storage location information.

According to still another aspect of the present invention, there is provided a machine-readable storage medium containing a data group of a program file. The program file is used when contents are to be transmitted from a program serving site via a communication network to a client for reproduction by the client. The program file defines a reproducing sequence of a plurality of contents and includes content information

defining or describing individual ones of the plurality of contents. The content information for each of the contents includes: storage location information that is indicative of a storage location of the content in the program serving site; identification information identifying the content; and displaying information pertaining to the content.

- 5 The storage location information is usable to retrieve the content from the program serving site and the displaying information is usable to make a visual display pertaining to the content.

The present invention may be constructed and implemented not only as the system or apparatus invention as set out above but also as a method invention. The present invention may also be embodied as a program for execution by a processor such as a computer or DSP, and as a storage medium storing such a program. Further, the present invention may be implemented as a storage medium storing program files of a novel construction.

- 15 For better understanding of the object and other features of the present invention, its preferred embodiments will be described in greater detail hereinbelow with reference to the accompanying drawings, in which:

Figure 1 is a block diagram showing a general hardware set up of a program reproduction system in accordance with a preferred embodiment of the present invention;

- 20 Figure 2 is a conceptual diagram explanatory of an example of a program list file employed in the program reproduction system of Figure 1;

Figure 3 is a conceptual diagram explanatory of an example of a program file employed in the program reproduction system of Figure 1;

- 25 Figure 4 is a block diagram conceptually showing an example of an operation panel;

Figure 5 is a conceptual diagram showing an example of an information display made in the program reproduction system;

Figures 6A to 6C are flow charts showing an example of program reproduction processing that is performed in the program reproduction system of the present invention;

- 30 Figure 7 is a flow chart showing an example of a favorite/original program process performed in the program reproduction system;

Figure 8 is a conceptual diagram showing an example of a program file which is

arranged to allow a plurality of contents to be reproduced concurrently in a parallel fashion;

Figure 9A is a diagram showing an example where a client station is a portable-type communication terminal; and

5 Figure 9B is a block diagram showing an exemplary inner structure of the portable-type communication terminal having a tone generating function.

Figure 1 is a block diagram showing a general hardware set up of a program reproduction system in accordance with a preferred embodiment of the present invention. The program reproduction system of Figure 1 includes a plurality of sites (i.e., program
10 serving sites or servers) A - N, a client (i.e., client station) PC and a communication network X connecting the program serving sites (servers) A - N and client station PC. Each of the sites (servers) A - N and client station PC comprises a computer including a CPU, ROM, RAM, hard disk, modem, etc. (all not shown) and can independently transmit and receive data (e.g., contents of an Internet-broadcast or other type of
15 distributed program) via the communication network X. Namely, the client station PC is connectable any desired one of various communication networks X, such as a LAN (Local Area Network), Internet and telephone line network, for transmission/reception of various data to/from any one of the program serving sites or servers A - N. Although the program reproduction system of the present invention may include other hardware
20 than the above-mentioned, it will be described hereinafter only in relation to a case where minimum necessary resources are employed. Note that the communication network X may be of the wireless type rather than the wire-connected type. Further, a plurality of clients (i.e., client stations) PC may be connected to the communication network X.

In the preferred embodiment, each of the independent sites A - N may be
25 constructed substantially similarly to a radio or television broadcasting station, and a great number of program files are prestored in a program storage section or area of each of the sites A - N. Each of the program files, which corresponds generally to a radio, television program, comprises a time-serial combination of various contents such as MIDI files in the form of music piece data, audio files in the form of data relating to sounds or voices
30 of the music piece or master of ceremonies (MC) and moving or still picture files in the form of video data, as will be later described in detail. The program contents, such as the MIDI, audio, moving picture and still picture files (content files), are prestored in

content databases (storage sections) of the individual program serving sites A - N, along with a multiplicity of other contents to be used for other purposes than the program distribution. All the program files stored in the individual program serving sites A - N can be identified by means of a program list file.

5 The client station PC can select any one of the program serving sites A - N and then select any one of the program files for reproduction. More specifically, the client station PC first receives (obtains or acquires) a program list from the selected site A - N to store it in memory as a program list file. Then, the client station PC selects any one of the programs on the program list and obtains a corresponding program file from the
10 selected site A - N to store it in memory. After that, the client station PC selects and obtains program contents (files) from the selected site A - N and reproduces the obtained program contents by means of a reproduction engine. The embodiment can use two reproduction modes, i.e., an "on-line reproduction mode" and an "off-line reproduction mode". In the "on-line reproduction mode", desired program contents are obtained from
15 the selected site A - N and reproduced on a real-time basis. In the "off-line reproduction mode", program contents designated by the program file are obtained collectively and then reproduced after being temporarily stored in a cache memory. Further, as will be later described in detail, an interested user can register his or her favourite program in a favourite program file and also create his or her own original program. These pieces
20 of information are stored into the client station PC as a favourite program list file and original program file. Note that the client station PC includes storage sections or storage areas provided in corresponding relation to the above-mentioned files.

Now, a brief description will be given about specific examples of the program list file and program file, with reference to Figures 2 and 3. Specifically, Figure 2 is a
25 conceptual diagram explanatory of an example of the program list file, while Figure 3 is a conceptual diagram explanatory of an example of the program file.

The program list file is a collection of data indicating a list of programs prestored in the individual program serving sites A - N and includes program names and URLs (Uniform Resource Locators) of program files, as shown in Figure 2. Each of the
30 program names represents a unique name or title assigned to one particular program, and each of the URLs of the program files represents a location in the site where one particular program file is stored and is uniquely assigned to the program file. For

instance, each of the URLs is an address (e.g., Internet address) assigned to a particular program file stored in one of the sites on the communication network X so that access to the particular program file can be made from the client station PC and another one of the sites A - N.

5 In each of the program files, there is stored content information, such as MIDI, audio, moving picture and still picture files, in a predetermined sequence of the program progression or reproduction. For instance, in the case of a given program made up of an opening MC (audio file), first music piece (MIDI file), MC (audio file), second music piece (MIDI file), third music piece (moving picture file) and ending MC (audio file),
 10 respective content information is stored in the program file in the mentioned order of the files, as illustratively shown in Figure 3. The program file is a collection of data indicating all the content information contained in one particular program, which includes content information consisting of a set of a "program name", "content URLs", "content IDs" and "basic content information". The program name is a unique name or title of
 15 one particular program similarly to the program name in the program list file. Each of the content URLs is information designating a location in which one particular program file is stored, each of the content IDs is information identifying one particular content, and each of the basic content information is descriptive of basic details of one particular program (such as a lyric writer, composer, player, etc. if the content concerns a music
 20 piece, or descriptive of a master of ceremonies if the program concerns an MC's speech. Further, the favourite program list file is constructed in a similar manner to the above-mentioned program list file, and the original program file is constructed in a similar manner to the above-mentioned program file.

25 Note that in the case where a music piece is stored as a moving picture file as with the third music piece in the program file of Figure 3, video data of moving and/or still pictures, rather than the music piece data alone, are recorded (e.g., a promotion video).

30 The following paragraphs describe an operation panel that is used in the inventive program reproduction system and can be operated by a user to reproduce a desired program. Figure 4 is a block diagram conceptually showing an example of the operation panel, which is provided on the client station PC so that a user can perform various operations such as ones for reproducing a desired program.

 In a "site displaying/selecting area" of the operation panel of Figure 4, a list of

the program serving sites A - N is displayed so that the user can select any desired one of the displayed sites A - N. In a "program displaying/selecting area" of the operation panel, program names specified by a program list file stored in the selected site are displayed so that the interested user can select any desired one of the displayed programs.

- 5 In a "basic information displaying area" of the operation panel, various basic information is displayed which pertains to a program content being currently reproduced (i.e., basic content information of a program file). Double-triangle button B1 pointing leftward is an REW button for fast-rewinding or fast-reversing a currently reproduced content, and a double-triangle button B4 pointing rightward is an FF button for fast-forwarding a
10 currently reproduced content. Single-triangle button B3 pointing rightward is a playback button for reproducing a content, and a square button B2 is a stop button for stopping reproduction of a content being reproduced. INFO button is a button for displaying later-described information. Favourite adding button is a button for adding a currently reproduced program to the favourite program list file, and a favourite editing button is
15 a button for displaying a favourite list editing screen (not shown) to allow the user to edit the favourite program list file. Original program editing button is a button for displaying an original program creating screen (not shown) to create/edit the original program file.

Although not specifically shown in Figure 4, the operation panel also includes a picture display area for displaying moving and still pictures.

- 20 In response to a user operation or activation of the INFO button, various information is displayed in a manner as shown in Figure 5. In the described embodiment, information pertaining to a picture is displayed in the left half of the screen and information pertaining to program contents is displayed in the right half of the screen. The information pertaining to program contents includes music-piece-related information
25 such as MIDI and audio files. More specifically, the name or title, genre, player, lyric writer, composer, label, file type, playing time, etc. of the music piece are displayed in response to the activation of the INFO button. Also displayed is a price at which the music piece (contents) can be purchased. Each program content can be purchased on line by any interested user or audience by activating a "purchase button". Techniques relating
30 to the online content purchase are well known and thus are not described here.

Figures 6A to 6C are flow charts showing an example of program reproduction processing that is performed in the program reproduction system of the present invention.

Specifically, Figures 6A, 6B and 6C show former, intermediate and latter portions, respectively, of the program reproduction processing.

At step 1 of Figure 6A, the user selects any one of the program serving sites displayed in the site displaying/selecting area on the operation panel (see Figure 4) installed on the client station PC, in order to reproduce a desired program distributed from the selected site. The sites selectable here include not only the plurality of sites A - N on the communication network X but also a local site (namely, the client station PC). When the local site has been selected (YES determination at step 2), programs names registered in the favourite program list file are displayed, at step 3, in the program displaying/selecting area on the operation panel. When, on the other hand, one of the networked sites A - N has been selected (NO determination at step 2), the URL of the selected site A - N is sent onto the communication network X at step 4. If the client station PC is not yet connected to the communication network X at that time, then it is connected to the communication network X by a dial-up connection or the like. Assuming that the site A has been selected by the user of the client station PC at step 4, the selected site A sends its program list file to the client station PC at step 5. The client station PC receives the program list file from the selected site A and stores the list file into its program list storage section. Then, at step 6, the client station PC displays programs names contained in the stored program list file in the program displaying/selecting area on the operation panel. At next step 7, the interested user can select any one of the programs from the program name list.

Once any one of the programs has been selected by the user, a determination is made as to whether or not the selected program is a user's original program at step 8 of Figure 6B. If the selected program is an original program (YES determination of step 8), the client station PC jumps to step 12 because the program file is already stored in the client station PC and thus there is no need to acquire any program file from the site A. If answered in the negative at step 8, i.e., if the selected program is not an original program, the client station PC sends the URL of the selected program file to the communication network X in order to acquire the program file from the site A at step 9. If, at that time, the client station PC is not connected to the communication network X (i.e., when the local site has been selected at step 2), then the client station PC is connected to the communication network X. Thus, the program serving site A sends the

program file designated by the URL to the client station PC, at step 10. The client station PC receives the program file from the site A and stores it into its program file storage section at step 11. In this way, the interested user can select any desired one of a multiplicity of programs.

5 After that, program contents are reproduced, in accordance with the selected original program file or acquired program file, in either the on-line reproduction mode or the off-line reproduction mode. The on-line reproduction mode is one selected by an user having his or her client station PC always connected to the communication network X, while the off-line reproduction mode is one selected by an user having his or her client
10 station PC connected to the communication network X by a dial-up connection only when necessary. In the on-line reproduction mode, necessary contents of a program are acquired one by one in real time from the program serving site A whenever the program contents are to be reproduced. In the off-line reproduction mode, on the other hand, all contents of a desired program to be reproduced are acquired collectively from the site A,
15 so that the off-line reproduction mode can significantly reduce the length of the time period when the client station PC has to remain connected to the communication network X. By contrast, the on-line reproduction mode can reduce the waiting or latency time before the content reproduction is initiated and thereby greatly enhance the real-time reproducibility due to the fact that each necessary program content is acquired in real
20 time.

When the program reproduction system is in the on-line reproduction mode as determined at step 12, the reproduction system behaves as follows. In this case, the client station PC automatically selects first or leading content information within the program file, at step 13. Then, at step 14, the client station PC displays basic content information
25 in the basic information displaying area on the operation panel. Although various other information is received or acquired from the program serving site A and then visually displayed, this basic content information is already stored in the program file and hence need not be acquired from the site A each time it is to be displayed, so that the network traffic can be effectively alleviated. After the display, the URL of the selected content
30 information is sent out to the site A at step 15, in response to which the site A sends the corresponding content file at step 16. Then, at step 17, the client station PC receives the content file from the site A and passes it to one of reproduction engines (i.e., dedicated

hardware devices or software programs for performing a necessary reproduction process) which corresponds to the type of the file, such as the MIDI, audio, moving picture or still picture, to start the content reproduction.

When the program reproduction system is in the off-line reproduction mode (NO determination at step 12), the system behaves as follows. First, the URL of every content information within the program file is sent from the client station PC to the program serving site A, which in turn sends all of the thus-designated content files to the client station PC at step 19. Here, the order in which the content URLs are sent from the client station PC and the content files are sent from the site A need not necessarily agree with an actual reproducing sequence of the contents in the program. If the client station PC is not connected to the communication network X at that time, the client station PC is connected to the communication network X. The client station PC receives all the content files from the site A and then is disconnected from the communication network X. The received content files are stored into a cache memory at step 20. Then, the client station PC selects first or leading content information within the program file at step 21, displays the basic content information at step 22, and passes each of the content files to one of the reproduction engines which corresponds to the type of the file, such as the MIDI, audio, moving picture or still picture, to start the content reproduction at step 23.

Whereas the client station PC in the preferred embodiment has been described as collectively receiving all contents of a program in the off-line reproduction mode, the present invention is not so limited, and the client station PC may collectively receive all contents of all programs or only designated ones of the programs present in the selected site, in which case the user is allowed to reproduce a plurality of programs in succession by being connected to the communication network only once. Further, although the client station PC in the preferred embodiment has been described as reproducing contents after having downloaded contents files to be reproduced, the client station PC may reproduce the contents immediately as the content files are distributed in streams.

Once the content reproduction has been initiated at steps 17 and 23, the client station PC proceeds to step 24 of Figure 6C, where a determination is made as to whether the content reproduction has been completed or not. If the content reproduction has been completed (YES determination at step 24), it is further determined at next step 25 whether there is next or other content information in the program file. If answered in the

affirmative at step 25, that content information is selected at step 26. Then, if the on-line reproduction mode is on (YES determination at step 27), the client station PC reverts to step 14, but if the off-line reproduction mode is on (NO determination at step 27), the client station PC reverts to step 22. If there is not next or other content information in the program file (NO determination at step 25), a next program file within the program list file is selected at step 28, and the client station PC reverts to step 12. In this way, a plurality of programs can be reproduced one after another. Note that if there is not a next program file within the program list file as determined at step 28, this means that reproduction of all the contents in the program has been completed, and thus the program reproduction processing of Figures 6A to 6C may be terminated or the leading program file in the program list may be again selected.

At step 29 of Figure 6C, a determination is made as to whether the fast-forwarding (FF) button or fast-rewinding (REW) button has been operated or activated during the content reproduction. If the fast-forwarding (FF) button has been activated as determined at step 29, the client station PC, at step 30, selects other content information immediately following the content being currently reproduced within the program file, or if the fast-rewinding (REW) button has been activated, the client station PC, at step 30, selects other content information immediately preceding the currently reproduced content. After step 30, the client station PC reverts to step 27. This way, the user is allowed to skip a non-favourite music piece or listen to a currently-reproduced music piece more than once unlike with an ordinary radio or television program.

When the INFO button has been activated as determined at step 31, the client station PC sends the content ID of the selected program file to the program serving site A at step 33. If the client station PC is not connected to the communication network X at that time, the client station PC is connected to the communication network X. Upon receipt of the content ID from the client station PC, the site A, at step 34, searches through the content database for content files corresponding to the content ID. For instance, if the content ID of a MIDI music piece has been received, the site A searches for audio contents, still picture contents (e.g., a photograph on a CD jacket), miscellaneous information contents (e.g., name, genre, player, lyric writer, composer, label, playing time length, purchase price, etc. of the music piece), music score contents and the like. Then, the site A creates an information file on the basis of the searched

content files and sends the thus-created information file to the client station PC at step 35. The client station PC receives the information file from the site A and visually displays it at step 36.

As noted earlier, the purchase button is displayed on an information displaying screen of Figure 5. By activating the purchase button to purchase a desired content such as a MIDI music piece file (YES determination at step 37), the user is allowed to purchase the desired content and other contents related to the desired content such as an audio content file and music score content file. For that purpose, the client station PC sends a purchase command and the content ID of the desired content to the site A at step 38, in response to which the site A, at step 39, carries out a process pertaining to the requested purchase of the desired content and other contents related to the desired content. Note that the contents acquired for reproduction within the program and the contents purchased here may be in the following relationship. For example, the contents acquired for reproduction within the program may be those covering just a part of a music piece or low-quality sample contents, while the contents purchased here may be those covering the whole of the music piece or high-quality contents. Then, at step 40, other processing is carried out irrespective of whether the purchase button has been activated or not. The other processing of step 40 includes various operations pertaining to information to be displayed in response to a user selection (mouse-clicking) on the information displaying screen; for example, when the item "player" has been selected, step 40 searches for and displays a content pertaining to the player. After completion of the other processing, the client station reverts to step 24.

The above-mentioned information-displaying and content purchasing operations are carried out in the same manner for both the program supplied from the site A and the favourite or original program stored locally. Further, these information-displaying and content purchasing operations are carried out even with the FF or REW button activated. Thus, any interested user can acquire information and contents of any desired music piece at any desired time.

When the user has activated the favourite adding button, favourite editing button or original program creating button without activating the INFO button as determined at step 31, a favourite/original program process is performed at step 32.

Figure 7 is a flow chart showing an example of the favourite/original program

process. When the favourite adding button has been activated as determined at step 51, a currently-selected program file is registered into the favourite program list file at step 52; that is, the program name and URL of the selected program file are additionally registered. When the favourite editing button has been activated and thus an YES
 5 determination has been made at step 53, the favourite program list file is edited at step 54; for example, at this step 54, the sequence of the programs in the favourite program list is changed, or a selected one or more of the programs is deleted. The editing of the favourite program list file is carried out by visually showing an editing screen (not shown) on the display to permit desired editing operations by the user utilizing the screen.

10 Further, when the original program creating button has been activated and thus an YES determination has been made at step 55, the client station PC goes to step 56, where are specified one or more keywords pertaining to a content to be stored as an original program. For example, the player's name, musical genre, etc. may be designated as the keywords. Then, at step 57, the client station PC sends the specified keywords and a
 15 search command to the site A. On the basis of the keywords, the site A searches through the content database corresponding contents and lists up and the corresponding contents at step 58. Then, at step 59, the program serving site A creates an original program file based on the listed contents and sends the thus-created original program file to the client station PC. Similarly to ordinary program files, the original program file includes content
 20 URLs, content IDs and basic content information; note that the contents in the original program file are arranged in a predetermined order, such as English or Japanese alphabetical order or order in which they have been found. Then, the client station PC receives the original program file from the site A and registers it into the favourite program list at step 60. Then, the user can edit the original program file as necessary
 25 at step 61; for example, the user changes the sequence of the contents or deletes a selected one or more of the contents. If a new original program is created in the site A, then the old original program file stored in the client station PC may be discarded, or only new contents may be added to the existing original program file. Alternatively, a plurality of such original program files may be stored.

30 Although the processing of Figure 7 has been described to create an original program file by arranging, in a predetermined order, contents listed through a search by the site A, only desired ones of the listed contents may be designated by the client station

PC so that the site A can create an original program file of the client-designated contents alone. Further, the program editing function may be possessed by the site A rather than the client station PC; in such a case, an editing command is issued from the client station PC, on the basis of which the site A performs editing to change the sequence of the contents and/or delete a selected one or more of the contents.

Although not specifically shown in the above-described processing flows of Figures 6A - 6C and 7, reproduction of any content can be stopped compulsorily by activating the stop button of Figure 4 and can be resumed by again operating the stop button. Further, arrangements may be made to optionally terminate the above-described operations by the user giving an instruction.

In the above-described program reproduction system, each program is caused to progress by reproducing contents sequentially one after another. Namely, because of the sequential or successive arrangement of contents in a program (program file), these contents can not be reproduced concurrently in a parallel fashion. However, the present invention is not so limited, and programs (program files) may be constructed in such a manner that a plurality of contents can be reproduced concurrently in a parallel fashion. Such an arrangement permits program making which can reproduce a MIDI music piece at the same time an audio MC speech file is reproduced, or reproduce a MIDI music piece while switching one still picture to another as a background picture.

Figure 8 is a diagram showing an example of a program file which is arranged to allow a plurality of contents to be reproduced concurrently in a parallel fashion. As shown, each program consists of a plurality of tracks which correspond to various different types of content files such as MIDI, audio, moving picture and still picture files. Namely, in this example, two or more types of content files are not stored mixedly in a single track, and the individual contents can be read out from the plurality of tracks in a parallel fashion (without overlapping each other) and passed to respective dedicated reproduction engines for reproduction purposes. That is, the reproduction engines also operate in parallel in corresponding relation to the content types. Process for reproducing data of a plurality of tracks in parallel is well known in the field of automatic performance and will not be described here. Note that reproduction timing of successive contents in a single track is set to not overlap each other. After readout of such a program file, the program file is subjected to the same operations as described above.

The plurality of tracks may be implemented by dividing a same storage area as shown in Figure 8 (i.e., storing each type of content in a different divided track), or by imparting track identifying data to each content instead of dividing the storage area (i.e., storing various contents mixedly in the tracks with track identifying data).

5 In reproducing a plurality of contents concurrently, it is desirable to impart a fade-in/fade-out effect or the like. For impartment of such a fade-in/fade-out effect, fading-in and fading-out contents may be prestored, or a command to impart fade-in and fade-out may be embedded in a program along with fade-in/fade-out timing information so that the fade-in and fade-out is effected upon readout of such a command. Where the
10 contents concern a music piece or MC speech, a command to impart an acoustic effect, such as a reverberation effect, may be embedded in addition to the fade-in/fade-out command. Further, where the contents concern a still or moving picture, there may be embedded a command to impart a video effect such as a mosaic or wipe effect. These effect may be imparted during reproduction of the contents rather than at the start or end
15 timing of the content reproduction.

Figure 9A is a diagram showing an example where the client station PC is a portable-type communication terminal MT, such as a cellular phone, PHS (Personal Handy Phone System in Japan) phone or other mobile terminal equipment. Assume here that the portable-type communication terminal MT has a tone generating function such as
20 a conventional tone generator or sequencer function. Figure 9B is a block diagram showing an exemplary inner structure of the portable-type communication terminal MT having such a tone generating function. The portable-type communication terminal MT includes a conventional portable phone circuit 101, and a microcomputer installed therein and including a CPU 102, a RAM 103 and a ROM 104. The portable phone circuit 101 and microcomputer communicate with each other via a communication interface 105. The
25 portable phone circuit 101 has an Internet function and a simplified Internet function. By establishing a radio communication connection between the terminal MT and any of the program serving sites A - N, information communication between the internal microcomputer and the site A - N is permitted via the communication interface 105.

30 Program and data necessary for implementing the tone generating function are stored in the ROM 104 along with a program reproducing program (application software) of the present invention. In this case, the ROM 104 may comprise a rewritable memory, such

as a flash ROM so that the tone generating program, data and/or program reproducing program of the present invention can be updated whenever necessary.

Let's assume here that various switches associated with the portable phone circuit 101 are used to perform functions of various input buttons of the communication terminal MT. In this case, information representing user's switch operation generated by the portable phone circuit 101 is received by the above-mentioned internal microcomputer via the internal communication interface 105, and the above-described various operations are carried out in accordance with input operation signals generated via the microcomputer. Further, various data, such as contents received from any of the program serving sites A - N, are received from the portable phone circuit 101 and passed via the communication interface 105 to the internal microcomputer for storage into the RAM 103. The thus-received contents and other data are passed via the interface 105 to the portable phone circuit 101 to be visually shown on a display associated with the phone circuit 101. Further, the received contents and other data, or contents and other data generated by the internal microcomputer can be delivered via the communication interface 105 to the portable phone circuit 101, from which they can be transmitted via a radio telephone line to another portable-type communication terminal MT or personal computer (e.g., by being attached to an e-mail) as desired. In addition, the contents generated by the internal microcomputer can be passed via the communication interface 105 to the portable phone circuit 101 so that they are audibly sounded through an internal speaker or visually shown on the display. The portable-type communication terminal MT may further include a MIDI interface 106 for exchange of MIDI performance data with the outside. Furthermore, any desired one of MIDI, audio, moving picture and still picture files received from any one of the program serving sites (servers) A - N may be stored into an appropriate storage so that it can be used as incoming-call informing melody or picture data or melody to be sounded during a call-holding period. Moreover, any one of the received MIDI, audio, moving picture and still picture files may be used as background music or visual image during a telephone call.

Also note that when some content is purchased by the user, the purchase price of the content may be added to the user's charge for using the communication terminal MT, or may be billed to the user separately from the charge for using the communication terminal MT. In the case where the portable-type communication terminal MT is used

as the client station PC like this, it may be equipped with only some, rather than all, of the above-mentioned functions.

Whereas the fast-forwarding (FF) or fast-rewinding (REW) button has been described as selecting another content immediately preceding or following a currently-reproduced content, it may be used to move the reproduction forward or backward by an amount corresponding to a predetermined time. Further, when a given content immediately preceding or following a currently-reproduced content is to be selected for a type of program whose contents of a plurality of tracks are reproduced concurrently, arrangements may be made for the user to decide a particular one of the tracks for which to move the reproduction forward or backward by one content or to fixedly preset such a particular one of the tracks for which to move the reproduction forward or backward. Furthermore, it is not always necessary for the inventive program reproduction system to possess both of the functions to fast-forward or fast-rewind the content, and only either one of the functions may be possessed. Moreover, the inventive system may be arranged to be able to fast-forward or fast-rewind during a temporary stop of the content reproduction instead of being able to fast-forward or fast-rewind during the content reproduction.

Display of various and instruction for purchasing a content may be performed using a Web browser. Namely, a Web browser process may be activated separately from the above-described client station processing so that the information display and content purchase instruction can be made in the Web browser process. Besides, the information display and content purchase instruction may be enabled during a temporary stop of the content reproduction rather than during the course of the content reproduction.

Program files, content files and various other data may be supplied from an external storage medium to the inventive program reproduction system, or may be supplied from an external device via a communication interface to the sites and/or client station.

Content information, such as program files, may be stored time-serially in successive storage areas, or content information stored in disbursed storage areas may be managed as a time-serial succession of data. Namely, it does not matter whether or not the content information is stored in successive storage areas, as long as it can be managed as a time-serial succession of data.

Moreover, the above-mentioned functions of the present invention may be implemented by use of resources (such as a not-shown CPU, RAM and ROM) within the portable phone circuit 101, rather than by the internal microcomputer provided separately from the portable phone circuit 101.

5 Furthermore, the music files employed in connection with the present invention need not necessarily be in the MIDI format and may be prepared by encoding music performance information using some encoding scheme. The audio files need not be in the PCM format and may be in any other suitable compressed data format such as ADPCM or DPCM. Similarly, the moving picture and still picture files may be in a
10 suitable compressed data format.

In summary, the present invention is characterized primarily in that program files including various content information, such as content URLs, are prestored in the client station so that necessary contents are read out collectively or one by one from a selected server on the basis of a selected one of the program files. By being thus arranged, the
15 present invention can appropriately reproduce even a program comprising a mixture of a plurality of contents of different characters and thus provide programs of a great variety of contents. Further, by the capability to reproduce a program on the content-by-content basis, the present invention allows a user to reproduce the program while optionally fast-forwarding or fast-rewinding a part of the same. Further by the capability to
20 designate any desired content in a program file to thereby selectively read out the designated content from a server, the user can purchase any desired content. Further, the user is allowed to freely create his or her own original program.

In addition, because various content-related information can be read out, content by content, on the basis of a program file, the present invention advantageously allows
25 the user to view or gain information corresponding to any desired information.

CLAIMS

1. A program reproduction system for transmitting and reproducing contents via a communication network, said program reproduction system comprising:

5 a program serving site having a memory storing a plurality of types of contents having different characters and adapted to supply a program file defining a reproducing sequence of a plurality of contents including contents of different characters; and

a client connectable to said program serving site via the communication network and having a plurality of types of reproduction engines capable of reproducing said
10 plurality of types of contents having different characters, said client being adapted to:

receive a program file from said program serving site;

receive, from said program serving site, contents specified by the received program file; and

15 reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced, using any one of the reproduction engines which corresponds to the type of the content to be reproduced.

2. A program reproduction system as claimed in claim 1 wherein said client includes an interface to the communication network and a processor coupled with said interface,
20 said processor being connected to the communication network via said interface and adapted to:

receive a program file from said program serving site via the communication network;

25 receive contents specified by the received program file, from said program serving site via the communication network; and

reproduce each of the received contents in a reproducing sequence defined by the received program file, using any one of the reproduction engines which corresponds to the type of the received content.

30 3. A program reproduction system as claimed in claim 1 wherein said plurality of types of contents having different characters include a content of music performance information prepared in a predetermined data format and a content of audio sound or

voice.

4. A program reproduction system as claimed in claim 1 wherein said program serving site is capable of supplying a plurality of program files, and said client is adapted to
5 selectively designate a desired one of the plurality of program files and receive the designated desired program file from said program serving site.

5. A program reproduction system as claimed in claim 4 wherein said client is adapted to selectively designate a desired one of the plurality of program files and make a
10 program list containing the designated desired program file.

6. A program reproduction system as claimed in claim 1 wherein said client includes a memory, an operator and a processor coupled with said memory and said operator, and said processor is adapted to, in response to an operation of said operator, edit the
15 reproducing sequence of the contents in the received program file to thereby provide an edited program file and store the edited program file into said memory.

7. A program reproduction system as claimed in claim 1 wherein said client is a portable-type communication terminal.
20

8. A program reproduction system as claimed in claim 1 wherein said program file contains storage location information that is indicative of a storage location of each of the contents in said program serving site, and said client receives a desired one of the contents from said program serving site on the basis of the storage location information.
25

9. A program reproduction system for transmitting and reproducing contents via a communication network, said program reproduction system comprising:

a program serving site including a memory storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of
30 contents; and

a client connectable to said program serving site via the communication network and including a reproduction engine for reproducing contents and an operator adapted to

give at least one of fast-forwarding and fast-rewinding instructions, said client being adapted to:

receive a program file from said program serving site;

5 receive, from said program serving site, contents specified by the received program file;

reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced, using said reproduction engine; and

10 fast-forward or fast-rewind a currently-reproduced content in the program file to be reproduced, in accordance with the fast-forwarding or fast-rewinding instruction given via said operator.

10. A program reproduction system for transmitting and reproducing contents via a communication network, said program reproduction system comprising:

15 a program serving site including a memory storing a plurality of contents, and adapted to make a search through said memory to retrieve therefrom one or more contents satisfying a given search condition and make a program file defining a reproducing sequence of a plurality of contents containing the retrieved contents; and

20 a client connectable to said program serving site via the communication network and including a reproduction engine for reproducing contents, said client being adapted to:

specify a desired search condition to said program serving site;

receive a program file from said program serving site;

receive, from said program serving site, contents specified by the received program file; and

25 reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced, using said reproduction engine.

11. A program reproduction system as claimed in claim 10 wherein said program serving site makes the search in accordance with the search condition specified by said client, makes a program file containing the retrieved contents and sends the made program file to said client, and

wherein said client receives, from said program serving site, the made program

file containing the retrieved contents.

12. A program reproduction system as claimed in claim 11 wherein said client includes an operator and a processor coupled with said operator, and said processor is adapted to,
5 in response to an operation of said operator, edit the reproducing sequence of the contents in the program file received from said program serving site.

13. A program reproduction system for transmitting and reproducing contents via a communication network, said program reproduction system comprising:

10 a program serving site including a memory storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents and content-related information for individual ones of the contents; and

a client connectable to said program serving site via the communication network and including a reproduction engine for reproducing contents and a display section, said
15 client being adapted to:

receive a program file from said program serving site;

receive, from said program serving site, contents specified by the received program file;

reproduce each of the received contents in a reproducing sequence defined by
20 a program file to be reproduced, using said reproduction engine; and

receive, from said program serving site, the content-related information for each received content or each content which is being currently reproduced and display the received content-related information on said display section.

25 14. A program reproduction system as claimed in claim 13 wherein said program file contains identification information identifying the individual contents, and said client receives the content-related information from said program serving site on the basis of the identification information of the currently reproduced content.

30 15. A program reproduction system as claimed in claim 13 wherein said program serving site includes a memory storing content-related information for individual contents.

16. A program reproduction system for transmitting and reproducing contents via a communication network, said program reproduction system comprising:

a program serving site including a memory storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, the program file containing content-related information for individual ones of the contents; and

a client connectable to said program serving site via the communication network and including a reproduction engine for reproducing contents and a display section, said client being adapted to:

- 10 receive a program file from said program serving site;
- receive, from said program serving site, contents specified by the received program file;
- reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced, using said reproduction engine; and
- 15 retrieve, from said program serving site, the content-related information for each received content or each content which is being currently reproduced and display the retrieved content-related information on said display section.

17. A program reproduction system for transmitting and reproducing contents via a communication network, said program reproduction system comprising:

a program serving site including a memory storing a plurality of contents, and adapted to supply a program file defining a reproducing sequence of a plurality of contents and perform a content selling process upon receipt of a content purchase request; and

25 a client connectable to said program serving site via the communication network and including a reproduction engine for reproducing contents and an operator, said client being adapted to:

- receive a program file from said program serving site;
- receive, from said program serving site, contents specified by the received
- 30 program file;
- reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced, using said reproduction engine; and

generate a content purchase request in response to an operation of said operator and transmit the content purchase request to said program serving site.

18. A program reproduction system as claimed in claim 17 wherein said client generates the content purchase request asking for one of the contents which is being currently reproduced and transmits the content purchase request to said program serving site, and wherein, in response to the content purchase request from said client, said program serving site performs the selling process to sell said client a regular content corresponding to the content currently reproduced by said client.

10

19. A program reproduction system as claimed in claim 17 wherein said program serving site supplies said client with a predetermined sample content in response to a request from said client asking for any one of the contents specified by the program file, and wherein, for each of the contents having been finally determined to be sold via the selling process, said program serving site supplies said client with a non-sample regular content.

15

20. A method of transmitting contents from a program serving site via a communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of types of contents having different characters and adapted to supply a program file defining a reproducing sequence of a plurality of contents including contents having different characters, said method comprising the steps of:

20

causing said client to receive a program file from said program serving site;

25

causing said client to receive, from said program serving site, contents specified by the received program file; and

causing said client to reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced, using a reproduction engine which corresponds to the type of the content to be reproduced.

30

21. A machine-readable storage medium containing a group of instructions to cause said machine to execute a method of transmitting contents from a program serving site via a

communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of types of contents having different characters and adapted to supply a program file defining a reproducing sequence of a plurality of contents including contents having different characters, said

5 method being executed in said client, said method comprising the steps of:

causing said client to receive a program file from said program serving site;

causing said client to receive, from said program serving site, contents specified by the received program file; and

causing said client to reproduce each of the received contents in a reproducing
10 sequence defined by a program file to be reproduced, using a reproduction engine which corresponds to the type of the content to be reproduced.

22. A method of transmitting contents from a program serving site via a communication network to a client and reproducing the transmitted contents by the client, said program
15 serving site including a database storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, said method comprising the steps of:

causing said client to receive a program file from said program serving site;

causing said client to receive, from said program serving site, contents specified
20 by the received program file;

causing said client to reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced;

giving a fast-forwarding or fast-rewinding instruction; and

causing said client to fast-forward or fast-rewind one of the contents which is
25 being currently reproduced by said client, in accordance with the fast-forwarding or fast-rewinding instruction.

23. A machine-readable storage medium containing a group of instructions to cause said machine to execute a method of transmitting contents from a program serving site via a
30 communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, said

method being executed in said client, said method comprising the steps of:

- causing said client to receive a program file from said program serving site;
- causing said client to receive, from said program serving site, contents specified by the received program file;
- 5 causing said client to reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced;
- giving a fast-forwarding or fast-rewinding instruction; and
- causing said client to fast-forward or fast-rewind one of the contents which is being currently reproduced by said client, in accordance with the fast-forwarding or
- 10 fast-rewinding instruction.

24. A method of transmitting contents from a program serving site via a communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of contents, said method comprising

15 the steps of:

- causing said client to specify a desired search condition to said program serving site;
- causing said program serving site to make a search through said database to retrieve therefrom one or more contents satisfying the desired search condition specified
- 20 by said client;
- causing said program serving site to make a program file defining a reproducing sequence of a plurality of contents including the retrieved contents;
- causing said client to receive a program file from said program serving site;
- causing said client to receive, from said program serving site, contents specified
- 25 by the received program file; and
- causing said client to reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced.

25. A machine-readable storage medium containing a group of instructions to cause said

30 machine to execute a method of transmitting contents from a program serving site via a communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of contents and adapted

to supply a program file defining a reproducing sequence of a plurality of contents, said method being executed in said program serving site, said method comprising the steps of:

making a search through said database to retrieve therefrom one or more contents satisfying a search condition specified by said client; and

5 making a program file defining a reproducing sequence of a plurality of contents including the retrieved contents, the made program file being receivable by said client.

26. A machine-readable storage medium containing a group of instructions to cause said machine to execute a method of transmitting contents from a program serving site via a
10 communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, said method being executed in said client, said method comprising the steps of:

specifying a desired search condition to said program serving site;

15 receiving a program file from said program serving site;

receiving, from said program serving site, contents specified by the received program file; and

reproducing each of the received contents in a reproducing sequence defined by a program file to be reproduced.

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27. A method of transmitting contents from a program serving site via a communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, said method
25 comprising the steps of:

causing said client to receive a program file from said program serving site;

causing said client to receive, from said program serving site, contents specified by the received program file;

causing said client to reproduce each of the received contents in a reproducing
30 sequence defined by a program file to be reproduced; and

causing said client to display, on a display section, information related to each received content or each content which is being currently reproduced.

28. A machine-readable storage medium containing a group of instructions to cause said machine to execute a method of transmitting contents from a program serving site via a communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, said method being executed in said client, said method comprising the steps of:
- receiving a program file from said program serving site;
 - receiving, from said program serving site, contents specified by the received program file;
 - reproducing each of the received contents in a reproducing sequence defined by a program file to be reproduced; and
 - displaying, on a display section, information related to each received content or each content which is being currently reproduced.
29. A method of transmitting contents from a program serving site via a communication network to a client and reproducing the transmitted contents by the client, said program serving site including a database storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, said method comprising the steps of:
- causing said client to receive a program file from said program serving site;
 - causing said client to receive, from said program serving site, contents specified by the received program file;
 - causing said client to reproduce each of the received contents in a reproducing sequence defined by a program file to be reproduced;
 - causing client to generate a content purchase request asking for a desired content and transmit the content purchase request to said program serving site; and
 - causing said program serving site to perform a process to sell the desired content in response to the content purchase request from said client.
30. A machine-readable storage medium containing a group of instructions to cause said machine to execute a method of transmitting contents from a program serving site via a communication network to a client and reproducing the transmitted contents by the client,

said program serving site including a database storing a plurality of contents and adapted to supply a program file defining a reproducing sequence of a plurality of contents, said method being executed in said client, said method comprising the steps of:

receiving a program file from said program serving site;

5 receiving, from said program serving site, contents specified by the received program file;

reproducing each of the received contents in a reproducing sequence defined by a program file to be reproduced; and

generating a content purchase request asking for a desired content and transmitting
10 the content purchase request to said program serving site, the content purchase request causing said program serving site to start performing a predetermined process to sell the desired content.

31. A machine-readable storage medium containing a data group of a program file, the
15 program file being used when contents are to be transmitted from a program serving site via a communication network to a client for reproduction by the client,

said program file defining a reproducing sequence of a plurality of contents and including content information defining individual ones of the plurality of contents,

said content information for each of the contents including:

20 storage location information that is indicative of a storage location of the content in said program serving site;

identification information identifying the content; and

displaying information pertaining to the content,

wherein said storage location information is usable to retrieve the content from
25 said program serving site and said displaying information is usable to make a visual display pertaining to the content.

32. A program reproduction system as herein described, with reference to the accompanying drawings.



Application No: GB 0011955.2
Claims searched: 1-8,20-21

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Examiner: Mike Davis
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Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): G4A (AUIDB)

Int Cl (Ed.7): G06F

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0627690 A2 (IBM)	1,20,21 at least
X	WO 96/26493 A2 (DIGITAL INTERACTIVE SYSTEMS)	"

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.